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W. J. Carlson

The Snychronous Flashing of Fireflies

THE SNYCHRONOUS FLASHING OF FIREFLIES

BY

WINIFRED JEAN CARLSON

THESIS

FOR THE

DEGREE OF BACHELOR OF ARTS

IN

PSYCHOLOGY

COLLEGE OF LIBERAL ARTS AND SCIENCES

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7 June, 1920

THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

WINIFRED JEAN CARLSON

ENTITLED THE SYNCHRONOUS FLASHING OF FIREFLIES

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF BACHELOR OF ARTS

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INTRODUCTION.

Many discussions concerning the synchronous flashing of fire flies have appeared from time to time in Science. Since Morse[1.] published the first article on this subject, several other scientists and observers have made further contributions to this field. Some have supported Morse's idea of synchronism in the flashing of fire flies as well as "rhythmical" movements in other species of insects; other articles contradict this theory and endeavor to explain the phenomenon in various ways; and still others modify the extreme position taken on either side. The observation reported by Morse follows in part:

"Fifty years ago in Gorham, Main, while walking along the road I passed an open field and noticed to my astonishment hundreds of fireflies flashing in perfect unison. I watched this curious sight for some time and the synchronism of the flashing was unbroken. Many times after I have watched the luminous insects, hoping to see a repetition of this phenomenon, but the flashes in every instance were intermittent."

Morse concludes his second article on this subject[2.] by saying:

"I could positively vouch for the accuracy of these flashes. Independent observations made by F. Morse in Gorham, Me., Blair in Europe, Shelford in Borneo, Bumpus near Wood's Hole, Mass., Allard in Oxford, Mass., Nylander in North Main, are quite sufficient to establish the fact that these insects do at times flash in unison. The rarity is a mystery".

"A dozen or more might flash for a while in unison as a coincidence, but when thousands are observed to flash in unison no doctrine of probability or chance can account for it".

1. Morse, E.S, Science, 66. Feb. 4, 1916.
2 Morse, E.S. Science, 71, July 26, 1918.

3. Alland, H.A.S.67, Nov. 17, 1916
4. Purssell, J.V., Scientific American, Jan. 19, 1918.

5. Morse, F., Science, 71, Oct 25, 1918
6. Blair, W.E., Nature, Dec. 9 1915
7. Shelford, S. Science 67, Sep. 15 1916
8. Bumpus, Dr. H.C. Science 48, July 26 - 18
9. Newman, H.H, Science 68, Dec. 12, 1917

10. Wheeler, W.M., Science 68, Jan., 12, 1[illegible], 1
11. Nylander Science 71, July 26, 1918

12. Hudson, C.H. Science 71, Dec. 6 1918
13. Gates, R.C., Science 69, Sep 28, 1917

14. McDermott, A.F. Science, 69, Oct. 27, 1916
15. Barbon
16. Laurent, P., Science 68, Jan., 1917

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DC-AC

[illegible]

...music. (4/4 time). ...
...rhythmic repetitions that I received.

One ... remarked in connection with the eye movements ...
...that her eye movements flowing were as follows:

"There was at first a feeling of ... with certain flashes (illegible). ... visualized as a whole with indistinct ... cross produced more or less in the ... a continuation of the indistinct ... well shaped."

...observations made by these various investigators ... the conclusion of the experiments the question ... to give the following conclusion:

CONCLUSION.

From the foregoing experiments ... conclusion is drawn that any ... ing of "rhythm" or to elements of ... is due to a subjective factor ... fact by which kinds of visual ... aesthetic emotion called by ... ler to count colloring is ... series. In Systematic ... are constantly ... rhythm" ... or ... of ... visual ... of ... of "visual rhythm" ...

ticks are in reality all of equal intensity. Similarly in listening to the steady beats of the metronome we are able to interpret at will any sort of time to the series of sounds. Without changing the rate of beats of the metronome we can easily get an impression of four-four or three-four time all depending on the note we accent to ourselves.

In the same manner, it seems to me, we get the idea of rhythm in visual stimuli. When rhythm was called to the minds of observers upon seeing a number of flashes of light it was due to an inward (?) tendency composed of various mental processes which became organized (together) and resulted in such experiences as have been quoted in the introduction.

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